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Subject to technical change.  
 All dimensions in mm (inch).

We assume no liability for typing errors.  
 Different variations than specified are possible.  
 Please contact our technical consultants.

## Safety notes / Technical support

### Notes

- Installation, maintenance and commissioning may be accomplished only by qualified technical personnel.
- The product must be used only in the manner outlined in this instruction manual.

Special attention must be paid to warnings and notes as follows:

#### WARNING



Relates to a caution symbol on the product: A failure to observe the necessary precautions can result in death, serious injury and/ or considerable material damage.

#### WARNING



Relates to a caution symbol on the product: Risk of electric shock

#### WARNING



A failure to observe the necessary precautions can result in death, serious injury and/ or considerable material damage.

This symbol is used, when there is no corresponding caution symbol on the product.

#### CAUTION

A failure to observe the necessary precautions can result in considerable material damage.

### Safety symbols

| In manual and on product | Description  |
|--------------------------|--|
|                          | CAUTION: refer to accompanying documents (manual) for details. |
|                          | Earth (ground) Terminal  |
|                          | Protective Conductor Terminal                                  |

### Technical support

Please contact your local supplier (for address see [www.uwtgroup.com](http://www.uwtgroup.com)). Otherwise you can contact:

UWT GmbH  
 Westendstr. 5  
 D-87488 Betzigau

Tel.: 0049 (0)831 57123-0  
 Fax: 0049 (0)831 76879  
[info@uwtgroup.com](mailto:info@uwtgroup.com)  
[www.uwtgroup.com](http://www.uwtgroup.com)

## Introduction

### Applications

The device is used for level monitoring in all types of containers and silos.

It can be used with all powdery and granulated bulk materials with a density greater than 30 g/l (1.9 lb/ft³) that do not show a strong tendency to form crusts or deposits.

The units can be delivered with Ex-approvals for use in Dust Hazardous Areas.

A selection of fields of application:

- **Building materials industry**  
lime, moulding sand, etc.
- **Food industry**  
milk powder, flour, salt, etc.
- **Plastics industry**  
plastics granules etc.
- **Timber industry**
- **Chemical industry**
- **Mechanical engineering**

The VIBRANIVO oscillating probe is normally screwed into the lateral container wall so that it is level with the filling height to be registered and monitored.

The device can also be mounted from the top of the container. In this case an extension piece is used to mount the probe level with the height to be registered.

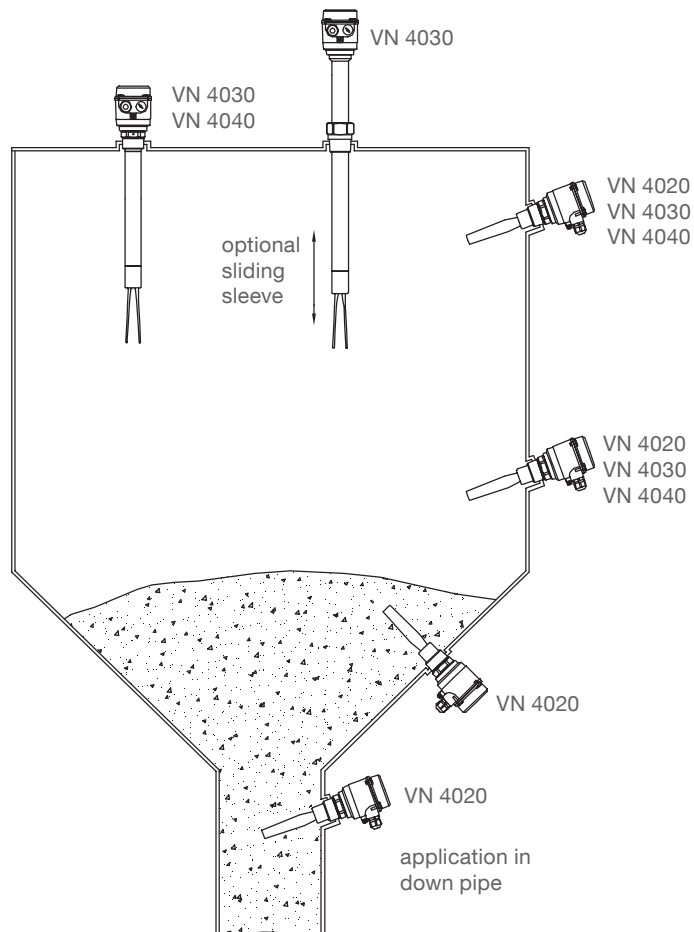
The length of the probe can be up to 4 m (157") with an extension tube (VN 4030, VN 4040).

The use of a sliding sleeve is recommended so that the switch point can be changed continuously during operation of the device.

### Function

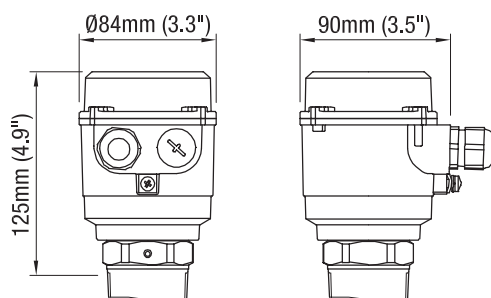
The piezo-electrically stimulated oscillating fork vibrates at its mechanical resonance frequency. If the probe is covered by the bulk material, the damping thus generated is registered electronically and a corresponding signal output is actuated.

The oscillation of the fork ensures a certain self-cleaning effect..

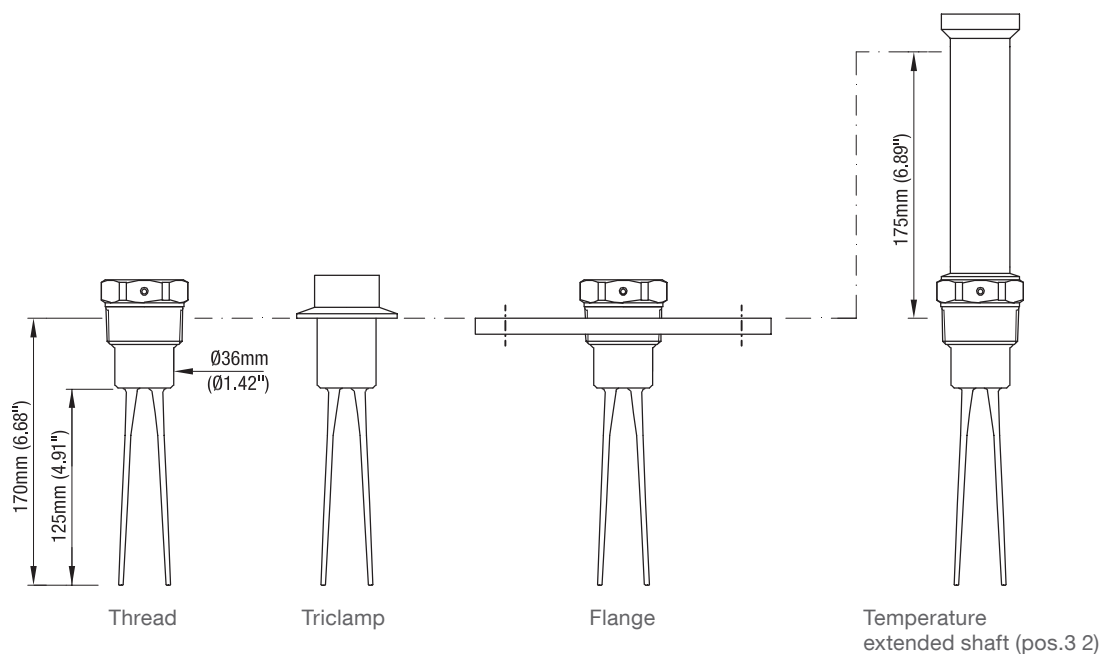


## Technical data

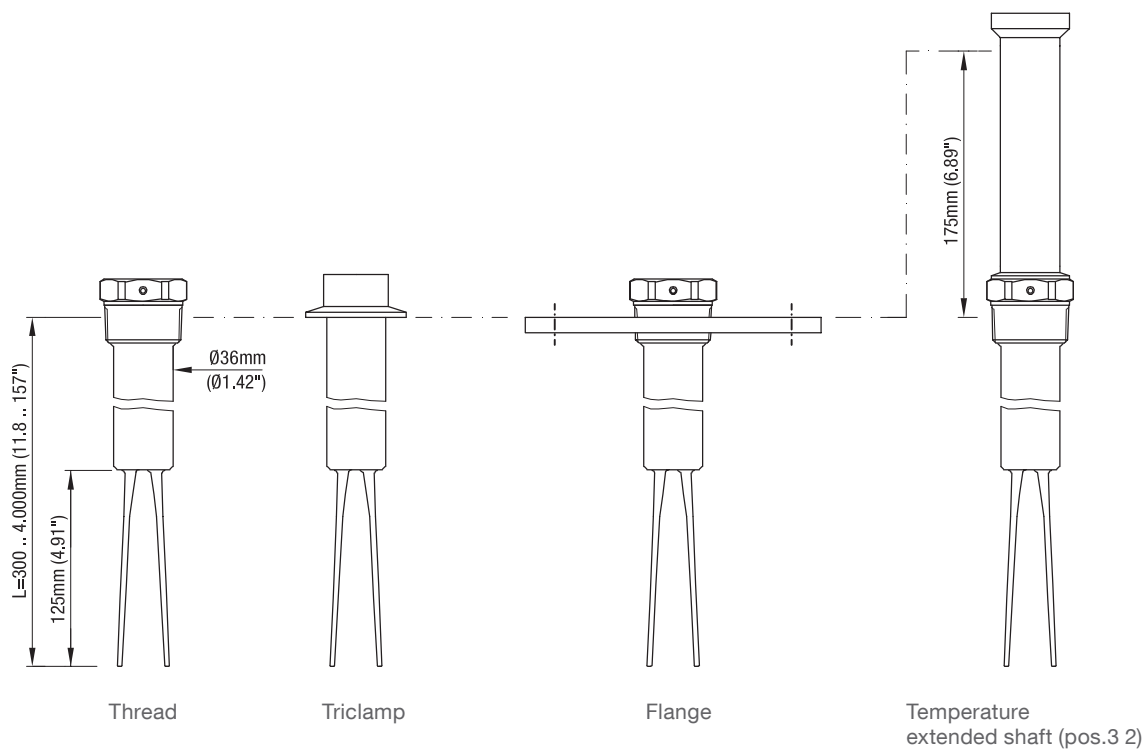
### Dimensions



#### VN 4020

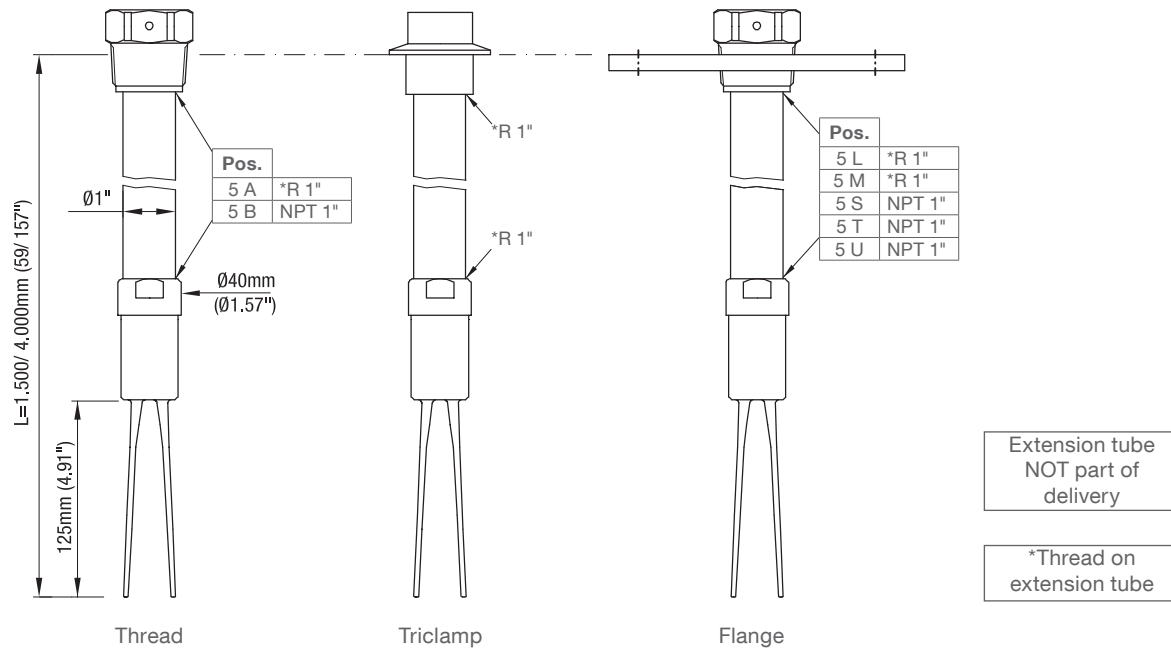


#### VN 4030



## Technical data

### VN 4040



## Technical data

### Electrical data

|                                   |   |
|-----------------------------------|---|
| <b>Connection terminals</b>       | 0.14 - 2.5 mm <sup>2</sup> (AWG 26-14)  |
| <b>Cable entry</b>                | M20 x 1.5 screwed cable gland<br>NPT 1/2" conduit connection<br>NPT 3/4" conduit connection<br><br>Clamping range (diameter) of the factory provided cable glands:<br>M20 x 1.5: 6 .. 12 mm (0.24 .. 0.47") |
| <b>Signal delay</b>               | Sensor free -> covered ca. 1 sec<br>Sensor covered -> free ca. 1 .. 2 sec   |
| <b>Safety operation (FSL,FSH)</b> | Switchable for minimum or maximum safety  |
| <b>Vibration frequency</b>        | ca. 200 Hz  |
| <b>Overvoltage category</b>       | II  |
| <b>Pollution degree</b>           | 2 (inside housing)  |

### Electronics

|                                      | <b>Universal voltage<br/>Relay DPDT</b>  | <b>3-wire PNP</b>  |
|--------------------------------------|--|--|
| <b>Power supply</b>                  | 19 .. 230 V 50 - 60Hz ±10%*<br>19 .. 40 V DC ±10%*<br>*incl. ±10% of EN 61010              | 18V .. 50 V DC ±10%*<br>*incl. ±10% of EN 61010  |
| <b>Max. ripple of power supply</b>   | 7 V <sub>ss</sub> at DC  | 7 V <sub>ss</sub>  |
| <b>Installed load/ input current</b> | max. 22 VA/ 2 W  | max. 0.5 A   |
| <b>Signal output</b>                 | Floating relay DPDT<br>AC max. 250 V, 8 A non inductive<br>DC max. 30 V, 5 A non inductive | Open Collector:<br>Permanent load max. 0.4 A<br>Short-circuit, overload and reverse polarity protected<br>Output voltage equal to input voltage, drop <2.5 V |
| <b>Indicating light</b>              | Status of signal output by built-in LED  | Status of signal output by built-in LED  |
| <b>Isolation</b>                     | Power supply to signal output: 2,225 Vrms<br>Signal output to signal output: 2,225 Vrms    | -  |
| <b>Protection class</b>              | I  | III  |

## Technical data

### Mechanical data

|   |  |  |
|---|--|--|
| <b>Housing</b>  | Aluminium housing, powder coated RAL 5010 gentian blue<br>Seal between housig and lid: NBR<br>Seal between housing and process connection: NBR<br>Nameplate: polyester film  |  |
| <b>Degree of protection</b>                                   | IP67* (EN 60529), NEMA Type 4X<br>* For version with plug the type of protection can be lower (see option plug/ page 10).  |  |
| <b>Partition wall between Zone 20 and Zone 21 (EPL Da/Db)</b> | Material:  | stainless steel  |
|   | Thickness:   | min. 1 mm  |
|   | Expected lifetime under constant functional vibration stress:  | 20 years (depending on application and ambient conditions) |
|   | Note: in case of high flow rate of abrasive dust, measures shall be provided to mitigate potential abrasion at the partition wall.   |  |
| <b>Process connection</b>                                     | Material: VN 4020: stainless steel 1.4581 (316)<br>VN 4030/ 4040: stainless steel 1.4305 (303)* or 1.4571 (316Ti)<br>(process connection and tube extension)<br>* The listed or higher-quality corrosion-resistant materials can be used.<br>Filler materials are not listed.<br>Thread: R 1½" tapered EN 10226 or NPT 1½" or NPT 1¼" tapered ANSI B 1.20.1<br>Flanges: according to selection 1.4541 (321) or 1.4404 (316L)<br>Triclamp: stainless steel 1.4301 (304) or 1.4404 (316L)<br>2" (DN50) ISO 2852<br>All material food grade |  |

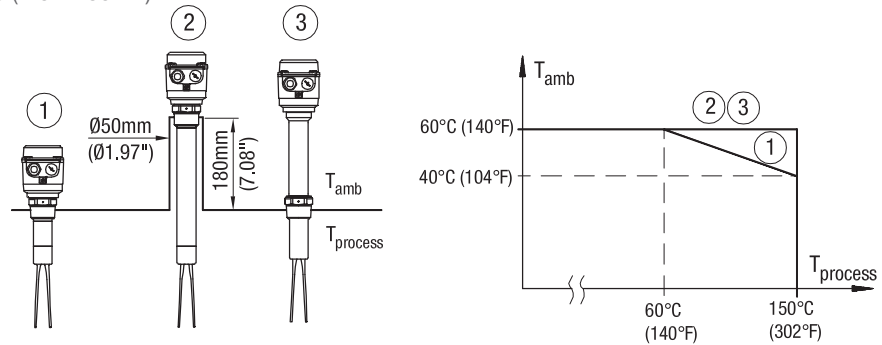
## Technical data

|                             |   |
|-----------------------------|---|
| <b>Tolerance length "L"</b> | ±10 mm (±0.39")   |
| <b>Oscillator</b>           | Material: stainless steel 1.4581 (316) (food grade)   |
| <b>Sound level</b>          | max. 50 dBA   |
| <b>Overall weight (ca.)</b> | VN 4020: 1.7 kg (3.7 lbs)<br>VN 4030: 1.7 kg (3.7 lbs) +1.9 kg/m (+4.2 lbs per 39.3") extension<br>VN 4040: 2.1 kg (4.6 lbs) +1.9 kg/m (+4.2 lbs per 39.3") extension |

## Operating conditions

**Ambient temp. (housing)** -40°C .. +60°C (-40 .. +140°F)

**Process temperature** -40°C .. +150°C (-40 .. +302°F)



For versions with Ex-approvals: see remarks on page 21.

|                                  |  |                                     |
|----------------------------------|--|-------------------------------------|
| <b>Ventilation</b>               | Ventilation is not required  |                                     |
| <b>Min. powder density</b>       | Setting A<br>ca. 150 g/l (9.5lb/ft³)   | Setting B<br>ca. 30 g/l (1.9lb/ft³) |
| <b>Features of bulk material</b> | No strong tendency to cake or deposit<br>Max. grain size 8mm (0.31")   |                                     |
| <b>Max. mechanical load</b>      | 500 N laterally (on oscillator rods)<br>Recommended protection in case of high material load: mounting of an protective angle above the probe  |                                     |
| <b>Max. mechanical torque</b>    | VN 4030: 250 Nm<br>VN 4040: 100 Nm   |                                     |
| <b>Max. process pressure</b>     | 16 bar (232 psi)<br>For versions with "sliding sleeve without process overpressure" (option pos.25 a, b): unpressurized.<br><br>The max. process pressure may be reduced with use of flanges. Observe flange standards for pressure rating and pressure derating with higher temperature.<br><br>For versions with Ex-approvals: see remarks on page 19. |                                     |
| <b>Vibration</b>                 | 1.5 (m/s²)²/Hz according to EN 60068-2-64  |                                     |
| <b>Relative Humidity</b>         | 0 - 100%, suitable for outdoor use   |                                     |
| <b>Altitude</b>                  | max. 2,000 m (6,562 ft)  |                                     |
| <b>Expected product lifetime</b> | Following parameters have a negative influence on the expected product lifetime:<br>High ambient- and process temperature, corrosive environment, high vibration, high flow rate of abrasive bulk material passing the sensor element.   |                                     |



## Technical data / Approvals

### Transport and Storage

|                  |   |
|------------------|---|
| <b>Transport</b> | <p>Observe the instructions as stated on the transport packaging, otherwise the products may get damaged.</p> <p>Transport temperature: -40 .. +80°C (-40 .. +176°F)<br/>         Transport humidity: 20 .. 85%</p> <p>Transport incoming inspections must be carried out to check for possible transport damage.</p> |
| <b>Storage</b>   | <p>Products must be stored at a dry and clean place. They must be protected from influence of corrosive environment, vibration and exposure to direct sunlight.</p> <p>Storage temperature: -40 .. +80°C (-40 .. +176°F)<br/>         Storage humidity: 20 .. 85%</p>   |

### Approvals

|   |  |  |   |
|---|--|--|---|
| <b>General Purpose (Ordinary Locations)</b><br>Depending on selected version in price list. | CE/ UKCA<br>FM<br>CSA<br>TR-CU   | EN 61010-1 (IEC/CB)  |   |
| <b>Hazardous Locations</b><br>Depending on selected version in price list.                  | ATEX<br>UKEX<br>IEC-Ex<br>FM<br>CSA<br><br>TR-CU<br>KC<br>CCC  | Dust explosion<br>Dust explosion<br>Dust explosion<br>Dust explosion<br>Dust explosion<br><br>Dust explosion<br>Dust explosion<br>Dust explosion | ATEX II 1/2D Ex ta/tb IIIC T! Da/Db<br>UKEX II 1/2D Ex ta/tb IIIC T! Da/Db<br>IEC-Ex ta/tb IIIC T! Da/Db<br>Cl. II, III Div. 1 Gr. E,F,G<br>Cl. II, III Div. 1 Gr. E,F,G<br>Ex DIP A20/21<br>Ex ta/tb IIIC T115°C...T150°C Da/Db X<br>Ex ta/tb IIIC T* °C Da/Db<br>Ex ta/tb IIIC T! Da/Db |
|   | Detailed allocation of types and electronics to approvals: see selection list.   |  |   |
| <b>EMC</b>  | EN 61326 - A1  |  |   |
| <b>Food grade material</b>  | According to directive 1935/2004/EC  |  |   |
| <b>RoHS conform</b>   | According to directive 2011/65/EU  |  |   |
| <b>Pressure Equipment Directive (2014/68/EU)</b>  | As the equipment does not have pressure-bearing housings of its own, it is not subject to the PED:<br>- as "pressure accessory" (see 2014/68/EU Art. 2 (5) and PED Guidelines A-08, A-40)<br>- as "safety accessory" (see 2014/68/EU Art. 2 (4) and PED Guidelines A-20, A-25) |  |   |

## Options

### Weather protection cover

When the measuring device is used outdoor, the use of the weather protection cover is recommended. It protects the device from all atmospheric influences such as:

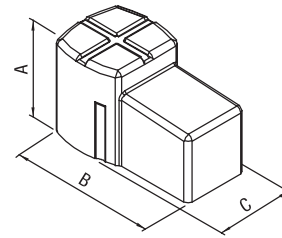
- rain water
- condensation of water
- excessively high temperatures due to insulation
- excessively low temperatures in winter

Material: PE, weathering and temperature stable

Not available for housing version d and de.



For use in Hazardous Locations: only permitted for Category 3 (zone 22) or Division 2.



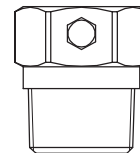
|   |                |
|---|----------------|
| A | 100 mm (3.94") |
| B | 165 mm (6.5")  |
| C | 88 mm (3.46")  |

### Sliding sleeve

VN 4030 G 1½" ISO 228 or 1½" NPT ANSI B 1.20.1 or flanges  
 Material: 1.4301 (304) or 1.4571 (316Ti)

Version with selection code pos.25 a,b,c:  
 Only for applications without process pressure, max. 150°C (302°F). Not available for Ex-approvals.

Version with selection code pos.25 e,f,g:  
 For applications with process pressure, max. 16bar (232psi), 150°C (302°F). Sealing material to the extension tube: FPM or NBR

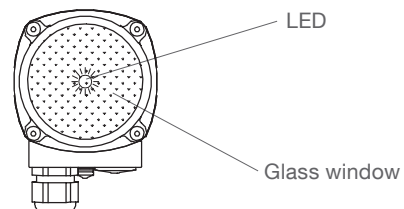


### Mounting set

Screws and washers for fixing the unit on a flange.

### Glass window in lid

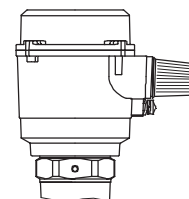
To see the indicating light on the electronic from outside.



### Control lamp

Bright indicating light (LED) seen from outside.

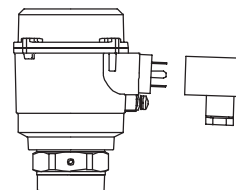
Not available for use in Hazardous Locations and FM/CSA general purpose.



### Plug 4-pole (incl. PE) IP65

Used instead of cable gland.

Not available for use in Hazardous Locations and FM/CSA general purpose.



## Mounting

### General Safety Instructions

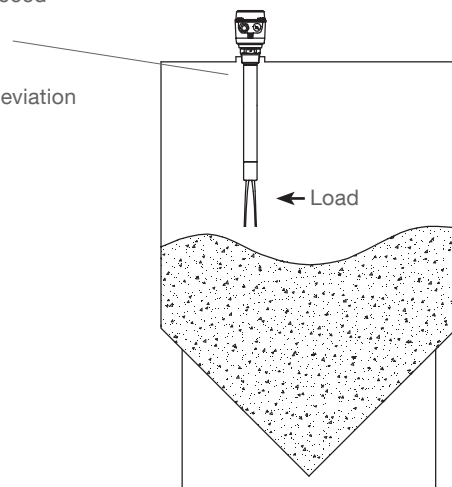
**Process pressure** ! Improper installation may result in loss of process pressure.

**Chemical resistance against the medium** ! Materials of construction are chosen based on their chemical compatibility (or inertness) for general purposes. For exposure to specific environments, check with chemical compatibility charts before installing.

**Temperature range** ! The range of the ambient and process temperature of the device must be observed (see page 8 and for Ex-approvals page 21)

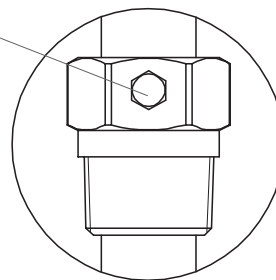
**Mechanical load** ! The torque at the fastening spot must not exceed 300 Nm VN 4030/ (100 Nm VN 4040).  
 Maximum length „L“ in dependence on the deviation (in degrees) from vertical installation:

| Max. deviation | Max. length „L“   |
|----------------|-------------------|
| 5°             | 4,000 mm (157.5“) |
| 45°            | 1,200 mm (47.24“) |
| >45°           | 600 mm (23.62“)   |



**Mounting location** Keep distance to incoming material and to the silo wall. The installation has to be done in a way, that the sensor elements cannot hit the wall of the silo. The flow of the medium and fixtures in the container must be considered. This is especially important for extension length more than 3 m (118.1“).

**Sliding sleeve** “Pressure tight” version (pos.25 e, f): Tighten both straining screws M8 with 12 Nm to obtain resistance against pressure.



**Flange mounting** A plastic sealing must be used to tighten the flange.

**Fastening of the threaded process connection** Mounting torque for the thread may not exceed 80 Nm. Use a 50 mm (1.97“), for units with sliding sleeve use a 55 mm (2.17“), open-end wrench. Do not fasten by turning the housing .

**Food grade material** The materials are available for the use under normal and predictable applications (according to directive 1935/2004 Art.3). Other conditions can influence the safety.

## Mounting



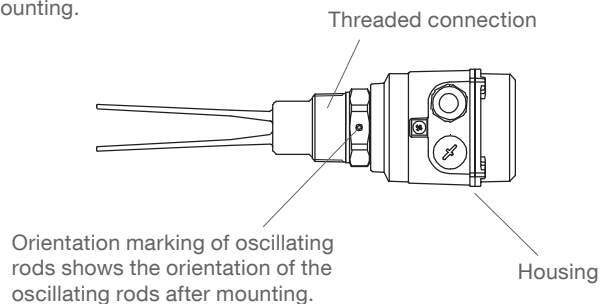
### Additional Safety Instructions for Hazardous Locations

|                                 |  |
|---------------------------------|--|
| <b>Installation regulations</b> | For devices to use in hazardous locations the respectively valid installation regulations must be observed.                            |
| <b>Sparks</b>                   | The installation has to be done in a way mechanical friction or impact can not cause sparks between the aluminium enclosure and steel. |

## Mounting instructions

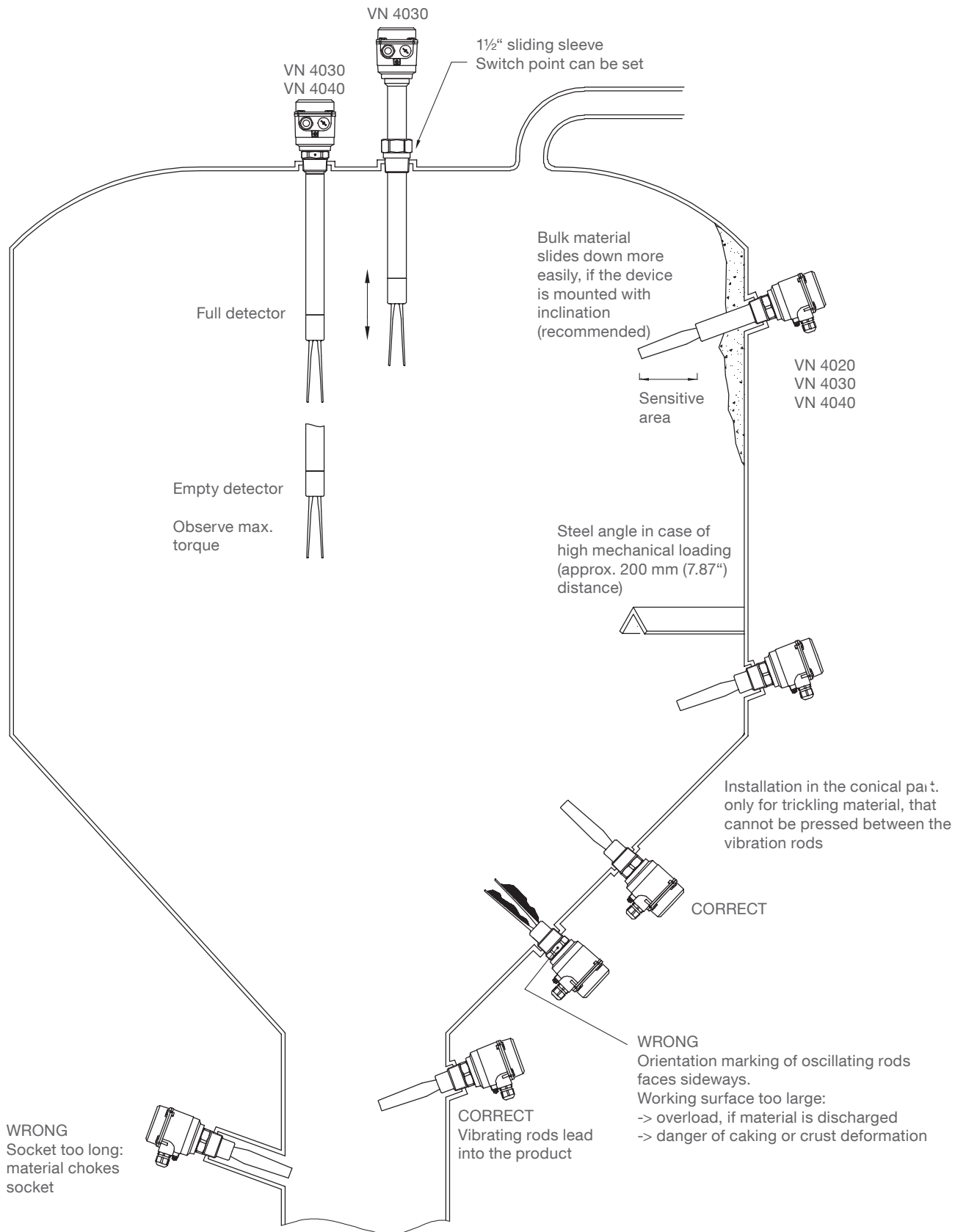
|                         |   |
|-------------------------|---|
| <b>Oscillating rods</b> | Do not bend, shorten or extend the oscillating rods since this will destroy the device. |
|-------------------------|---|

|  |  |
|--|--|
| <b>Rotatable housing and orientation marking of oscillating rods</b> | The housing can be rotated against the threaded connection after mounting. |
|--|--|



|  |   |
|--|---|
| <b>Direction of the cable glands</b>             | When the unit is mounted from the side, ensure, that the cable glands faces downwards and are closed to avoid water penetration into the housing.   |
| <b>Sealing</b>                                   | Seal the process thread with PTFE sealing tape in case of process pressure  |
| <b>Precaution for later dismantling/ Service</b> | Grease the screws of the lid if corrosive atmosphere is present (e.g. close to sea)   |
| <b>Switching point</b>                           | Heavy bulk material -> the signal output switches when the oscillating rods are covered a few mm<br>Light bulk material -> the signal output switches, when the oscillating rods are covered a few cm |

## Mounting



## Electrical installation

### General Safety Instructions

#### Handling



In the case of inexpert handling or handling malpractice the electric safety of the device cannot be guaranteed.

#### Protective earthing

Before any electrical installation, the device must be connected to the protective earthing terminal inside the housing.

#### Installation regulations

The local regulations must be observed.  
 With use of 24 V supply voltage, an approved power supply with reinforced insulation to mains is required.

#### Fuse

Use a fuse as stated in the connection diagrams (page 16).

#### RCCB protection

In the case of a defect, the distribution voltage must automatically be cut off by a RCCB protection switch so as to protect the user of the device from indirect contact with dangerous electric tensions.

#### Power supply switch

A Power-supply-disconnecting switch must be provided and marked near the device.

#### Wiring diagram

The electrical connections have to be made according to the wiring diagram.

#### Supply voltage

Compare the supply voltage applied with the specifications given on the electronic and name plate before switching the device on.

#### Cable gland/ closing element

The screwed cable gland and closing element must have following specifications:  
 Ingress protection IP67, temperature range from -40°C to +70°C, certified depending on the country where the unit is installed, pull relief.  
 Make sure that the screwed cable gland safely seals the cable and that it is tight (danger of water intrusion). Cable glands that are not used have to be locked with a closing element.

#### Conduit system

In case of using a conduit system (with NPT thread) instead of a cable gland the regulations of the country where the unit is installed must be observed. The conduit must have a tapered thread either NPT 1/2" or NPT 3/4" in accordance with the unit and ANSI B 1.20.1. Not used inlets must be closed tight with a metal closing element.

#### Field wiring cables

- The diameter has to match to the clamping range of the used cable gland.
- The cross section has to match with the clamping range of the connection terminals and consider the max. current.
- All field wirings must have insulation suitable for at least 250 V AC.
- The temperature rating must be at least 90°C (194°F).
- If higher immunity interferences as specified in the stated EMC standards are present (see chapter approval), a shielded cable is required, otherwise an unshielded instrumentation cable is satisfactory.

#### Connecting the terminals

Make sure that max. 8 mm (0.31") of the pigtails are bared (danger of contact with live parts).

#### Guiding the cables in the terminal box

Cut the field wiring cables to appropriate length to fit properly into the terminal box.

#### Relay and transistor protection

Provide protection for relay contacts and output transistors to protect the device against spikes with inductive loads.

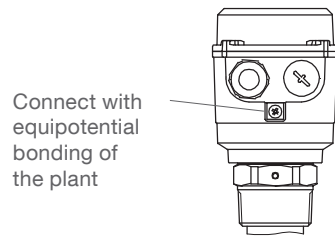
#### Protection against static charging

The housing of the unit must be grounded in any case to avoid static charging of the unit on applications with pneumatic conveying and non-metallic containers.

## Electrical installation

### ! Additional Safety Instructions for Hazardous Locations

#### External equipotential bonding terminal



#### Field wiring

A pull relief must be provided for the field wiring cables, when the device is installed with the factory provided cable glands.

#### Cable glands

Installation according to the regulations of the country, where the product is installed.

Not used entries have to be closed with blanking elements certified for this purpose.

Where available the factory provided parts must be used.

A strain relief must be provided for the field wiring cables, when the device is installed with the factory provided cable glands.

The diameter of the field wiring cable must match to the clamping range of the cable clamp.

If other than the factory provided parts are used, following must be ensured:

The parts must have an approval adequate to the approval of the level sensor (certificate and type of protection).

The approved temperature range must be from the min. ambient temperature of the level sensor to the max. ambient temperature of the level sensor increased by 10 K.

The parts must be mounted according to the instructions of the supplier.

#### Conduit system for FM and CSA

In addition the regulations of the country must be observed. The used flameproof seals and blanking elements must have an adequate type approval and a temperature range of at least  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ) to  $+80^{\circ}\text{C}$  ( $176^{\circ}\text{F}$ ). In addition they shall be suitable for the conditions and correctly installed. Where available the provided original parts of the manufacturer must be used.

#### Commissioning

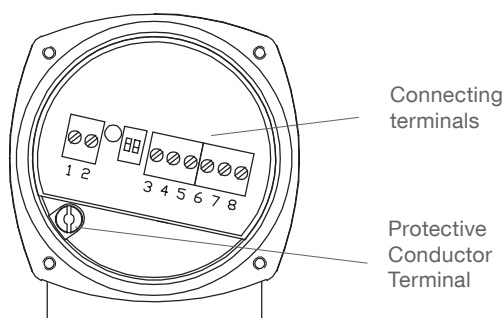
Commissioning only with closed lid.

#### Opening the lid

Before opening the lid take care, that no dust deposits or whirlings are present. Do not remove the lid (cover) while circuits are alive.

## Electrical installation

### Connection



#### Universal voltage Relay DPDT

##### Power supply:

19 .. 230 V 50 - 60Hz  $\pm 10\%$ \* 22 VA

19 .. 40 V DC  $\pm 10\%$ \* 2 W

\*incl.  $\pm 10\%$  of EN 61010

##### Fuse on power supply:

max. 10 A, fast or slow, HBC, 250 V

##### Signal output:

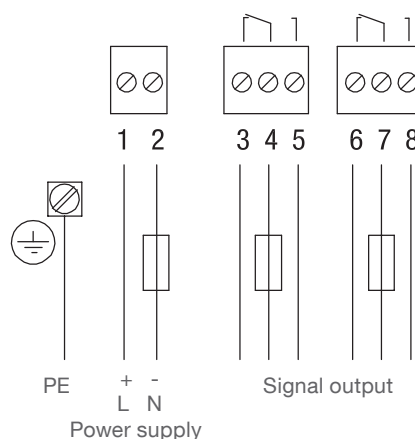
Floating relay DPDT

AC max. 250 V, 8 A, non inductive

DC max. 30 V, 5 A, non inductive

##### Fuse on signal output:

max. 10 A, fast or slow, HBC, 250 V



#### 3-wire PNP

##### Power supply:

18 .. 50 V DC  $\pm 10\%$ \*

\*incl.  $\pm 10\%$  of EN 61010

Input current: max. 0.5 A

##### Fuse:

max. 4 A, fast or slow, 250 V

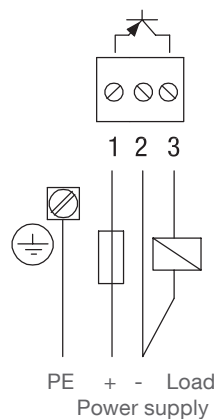
##### Signal output:

max. 0.4 A

Output voltage equal to input voltage, drop  $< 2.5$  V

##### Load for example:

PLC, relay, contactor, bulb





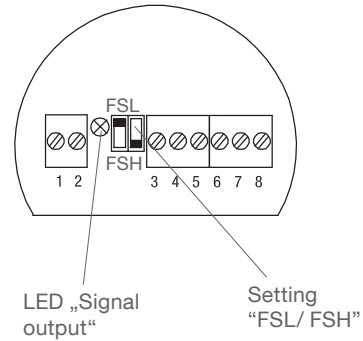
## Signal output / Sensitivity setting

### Signal output

#### FSL/ FSH Setting

**FSH** If the sensor is used to indicate full load, set to Fail Safe High. Power failure or line break is regarded as „full“ signal (protection against overcharging).

**FSL** If the sensor is used to indicate empty load, set to Fail Safe Low. Power failure or line break is regarded as „empty“ signal (protection against running dry).



|                     | Signal output |     | Signal output |     |
|---------------------|---------------|-----|---------------|-----|
| Setting             | FSL           | FSH | FSL           | FSH |
| Relay DTPT          |               |     |               |     |
| 3-wire PNP          |               |     |               |     |
| LED „Signal output“ |               |     |               |     |

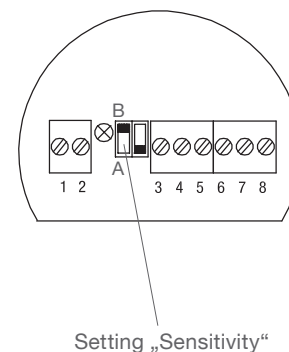
### Sensitivity setting

All sensors are factory setted. Therefore, they usually do not have to be re-setted. If the bulk material has a strong tendency to cake or deposit, the setting switch can be set to position „A“ so as to decrease the sensitivity of the probe (Factory presetting = position „B“).

Approximate min. bulk density on setting:

| A                    | B                   |
|----------------------|---------------------|
| Low sensitivity      | High sensitivity    |
| 150 g/l (9.5 lb/ft³) | 30 g/l (1.9 lb/ft³) |

Please contact manufacturer if you intend to use the device for special purposes.



## Maintenance

### Opening the lid (cover)

- Before opening the lid for maintenance reasons observe following items:
- Do not remove the lid while circuits are alive.
  - No dust deposits or whirlings are present.
  - No rain can enter into the housing.

### Frequent check of the unit

- To ensure durable safety in hazardous locations and with electrical safety, following items must be checked frequently depending on the application:
- Mechanical damage or corrosion of any components (housing side and sensor side) and of the field wiring cables.
  - Tight sealing of the process connection, cable glands and enclosure lid.
  - Properly connected external PE cable (if present).

### Cleaning

If cleaning is required by the application, following must be observed:

- Cleaning agent must comply with the materials of the unit (chemical resistance). Mainly the lid sealing, cable gland and the surface of the unit must be considered.

The cleaning process must be done in a way, that:

- The cleaning agent cannot enter into the unit through the lid sealing or cable gland.
- No mechanical damage of the lid sealing, cable gland or other parts can happen.

A possible accumulation of dust on the unit does not increase the maximum surface temperature and must therefore not be removed for purposes of maintaining the surface temperature in hazardous locations.

### Function test

A frequent function test may be required depending on the application.

- Observe all relevant safety precautions related with a safe work depending on the application (e.g. hazardous locations, hazardous bulk material, electric safety, process pressure).
- This test does not proof if the sensor is sensitive enough to measure the material of the application.

Function test is done by stopping the vibration of the vibrating rods with appropriate means and monitor if a correct change of the signal output from uncovered to covered happens.

### Production date

The production date can be traced by the serial number on the typeplate. Please contact the manufacturer or your local distributor.

### Spare parts

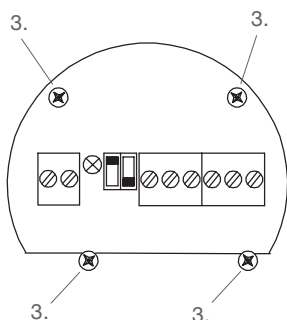
All available spare parts are stated in the selection list.

### Change of the electronic board:

Deenergise device and secure against being switched on again.

#### Version small housing:

1. Open the housing lid
2. Remove the field wiring cables/ plug
3. Unscrew the cover plate
4. Take out the electronic board and remove internal plug
5. Insert a new electronic board in reverse sequence
6. Connect the field wiring cables

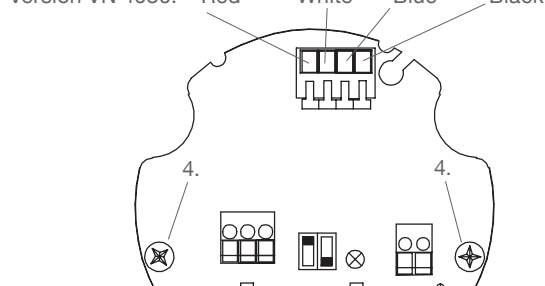


#### Version big housing:

1. Open the housing lid
2. Remove the field wiring cables
3. Remove the sensor cables
4. Unscrew the two fastening screws of the electronic board
5. Take out the electronic board
6. Insert a new electronic board and tighten fastening screws
7. Connect the sensor cables and field wire cable (see drawing)

#### Sensor cables

Version VN 4020: Red Red Yellow White Blue Blue Black Black



## Notes for use in Hazardous Locations

### Zone classification

|                   | Usable in zone | Category | Equipment Protection Level (EPL) |
|-------------------|----------------|----------|----------------------------------|
| Dust applications | 20, 21, 22     | 1 D      | Da                               |
|                   | 21, 22         | 2 D      | Db                               |
|                   | 22             | 3 D *    | Dc                               |

\* in case of conductive dust additional demands for the installation are possible.

### General Notes

#### Marking

Devices with EX approval are marked on the name plate.

#### Process pressure



Devices with Ex Approval are approved for atmospheric pressure.  
 A detailed explanation is given below for ATEX and applies analogously for other Ex approvals:  
 ● The scope of the ATEX directive is generally limited to atmospheric pressure, see ATEX directive 2014\_34\_EU Chapter 1 Art.2 (4).  
 Atmospheric pressure is defined as absolute pressure 0.8bar to 1.1bar, see ATEX guideline §50 and IEC 60079-0 chapter 1 Scope.  
 The technical background is that an explosive atmosphere which is compressed (overpressure) or released (underpressure) can exhibit different explosion behaviour than under atmospheric conditions. The standards for the types of protection against explosion (IEC 60079 series), on which a type approval according to the ATEX directive is based, are designed for atmospheric conditions and do not automatically cover deviating pressure conditions.  
 Thus, an ATEX type approval issued in accordance with this directive only covers atmospheric pressure.  
 This applies to all manufacturers.  
 A deviating operating pressure can be assessed and approved by an expert for the respective application.  
 Regardless of this, the design of the level indicators is suitable for a vessel overpressure / underpressure in accordance with the specified technical data.

#### Process and ambient temperature

The permitted temperature ranges are marked on the name plate.  
 The max. permitted ambient and process temperatures (including temperature derating) stated in this manual must be observed.

### ATEX/ UKEX: Year of manufacturing

Marking on the name plate is done according to IEC 60062 as follows:

| Year of manufacturing | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 |
|-----------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Marking code          | K    | L    | M    | N    | P    | R    | S    | T    | U    | V    | W    | X    |

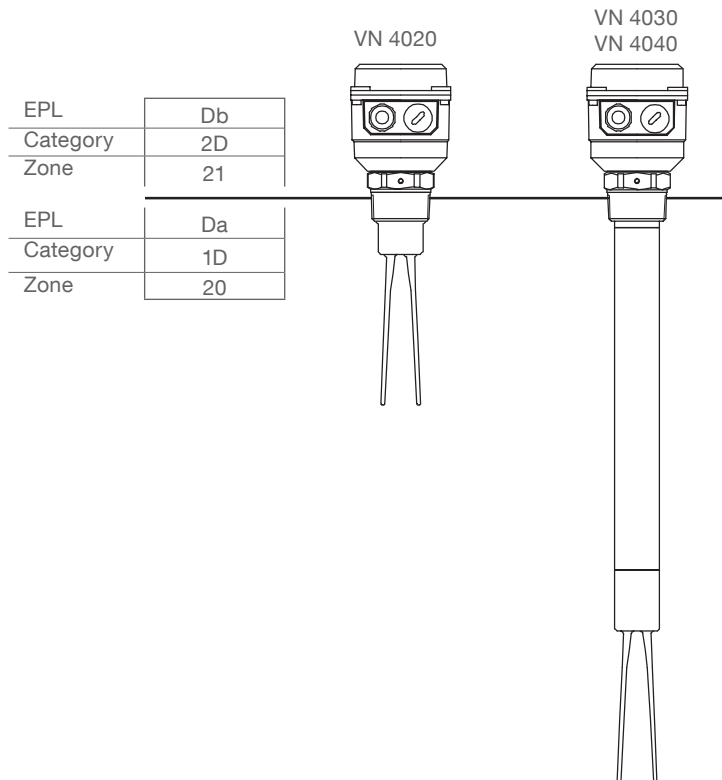
### ! Specific conditions of use

#### Electrostatic charge

The apparatus shall be installed in a way that danger caused by electrostatic charges is avoided.


## Notes for use in Hazardous Locations

Permitted zones for mounting in partition wall

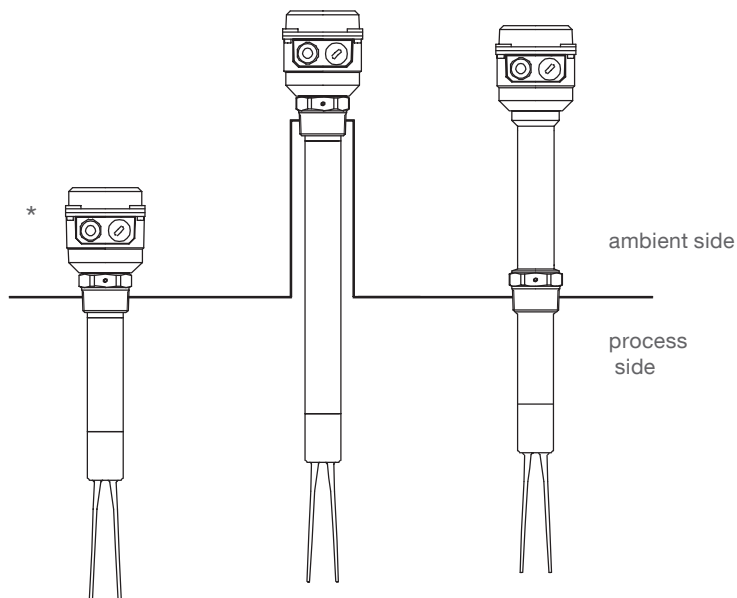


## Notes for use in Hazardous Locations

### Max. Surface Temperature and Temperature Class

The temperature marking on the type plate  refers to the instruction manual.  
 In the following table the relevant temperature ratings are shown.

The maximum surface temperature (resp. temperature class) is the warmest temperature of the unit which could occur during malfunction (according to Ex-definition)..



\* Max ambient temperature is derated when process temperature exceeds 60°C (140°F), see ① on page 8.

| Max. ambient temperature | Max. process temperature | Max. surface temperature (EPL Db) | Max. surface temperature (EPL Da) | Temperature class (Division System) |
|--------------------------|--------------------------|-----------------------------------|-----------------------------------|-------------------------------------|
| 60°C (140°F)             | 110°C (230°F)            | 115°C (239°F)                     | T <sub>200</sub> 115°C            | T4A                                 |
|                          | 120°C (248°F)            | 120°C (248°F)                     | T <sub>200</sub> 120°C            | T4                                  |
|                          | 130°C (266°F)            | 130°C (266°F)                     | T <sub>200</sub> 130°C            | T4                                  |
|                          | 140°C (284°F)            | 140°C (284°F)                     | T <sub>200</sub> 140°C            | T3C                                 |
|                          | 150°C (302°F)            | 150°C (302°F)                     | T <sub>200</sub> 150°C            | T3C                                 |

## Assembly VN 4040

### Manufacturing of the Extension tube

⚠ **Obtain instruction manual for proper manufacturing of the extension tube. In case of deviation from the instruction manual the unit is not safe for use in Hazardous Locations.**

#### Demands on the Extension tube

Material: Stainless steel 1.4301 (SS304) or 1.4305 (SS301) or 1.4571 (SS316Ti) or 1.4404 (SS316L)

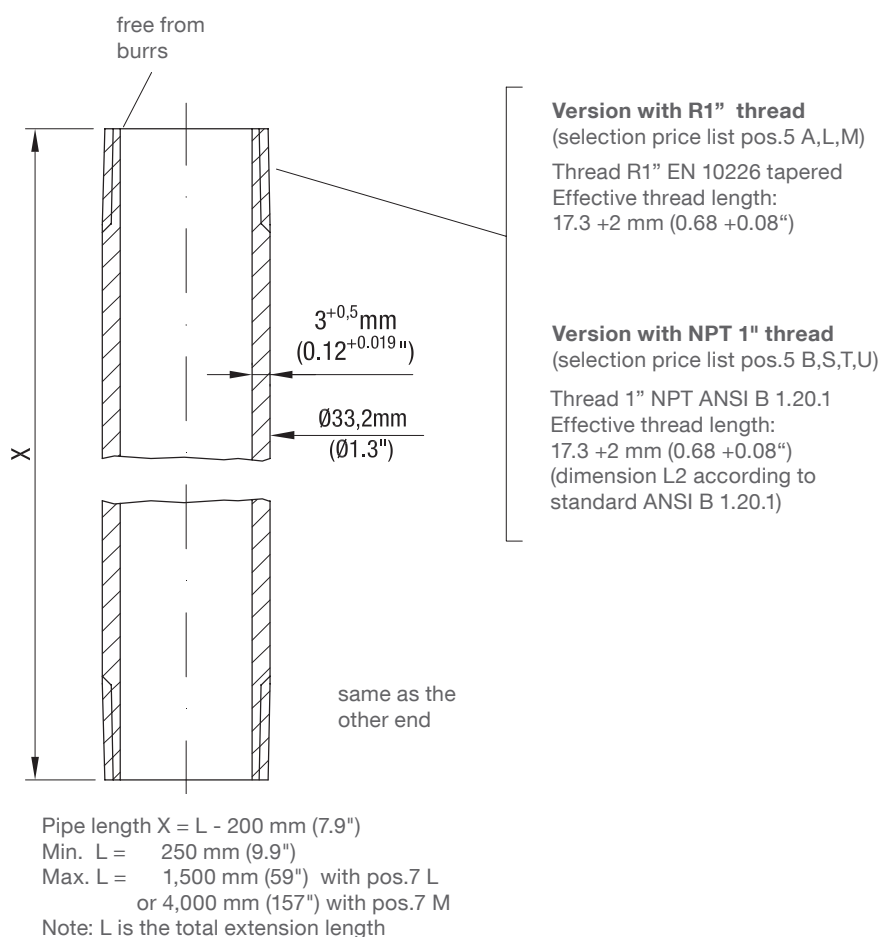
The tube must be manufactured from one single piece. It is not allowed to weld two or more pieces together.

Carefully observe max. length, diameter, wall thickness, thread, tolerances as specified in the drawing.

All sharp edges must be removed to protect the cable.

#### Thread testing

Each thread must be tested with go and no-go ring gauge according to standard EN 10226 (R1" version) or ANSI B 1.20.1 (NPT 1" version)



## Assembly VN 4040

### Assembly of the unit

#### 1. Mounting of the Extension tube

! The tube must be assembled very carefully to ensure permanent sealing, electrical grounding and mechanical stability. Observe the follow mounting instructions.

! Make sure that the thread of the extension tube and the thread of the screwed piece/ oscillating piece is the same type (do not mix R and NPT thread).

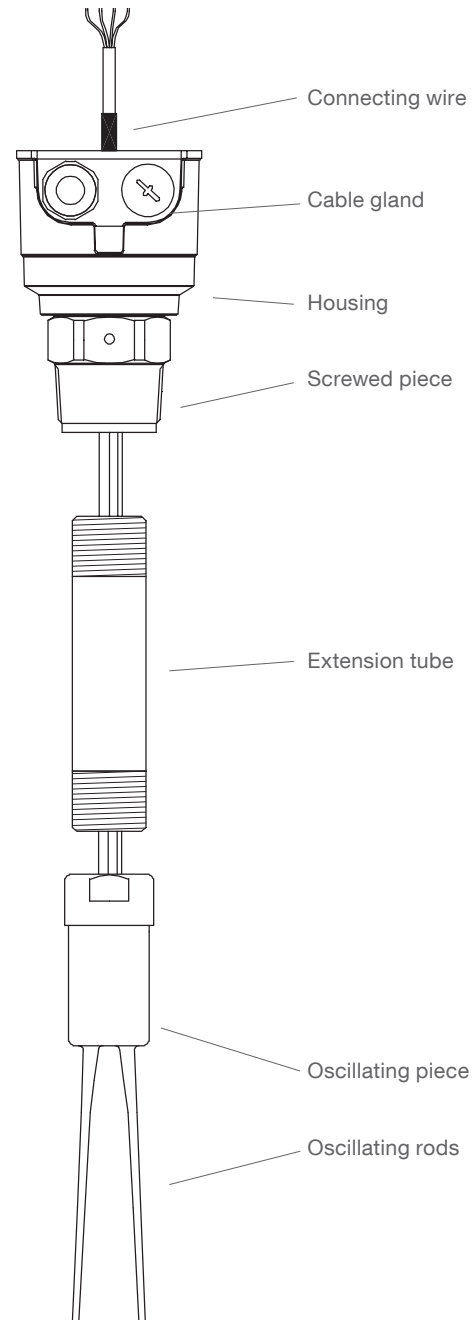
1.1. Feed the connecting wire through the 1" Extension tube and the screwed piece. Use a separate taut wire for easy working.

1.2. Screw the 1" Extension tube into the oscillating piece and the screwed piece.

#### Requirements for proper sealing and electrical grounding:

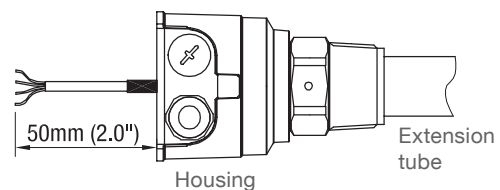
Sealing must satisfy IP67 or NEMA Type 4 at both sides of the extension tube. To reach this, the threads must be sealed with temperature resistant sealing for 150°C (302°F). Max. thickness of the sealing is 0.2 mm (0.008").

The threads must be fixed with 50 Nm.  
 Use a open-end wrench to attach the oscillating piece (do not use the oscillating rods).



#### 2. Checking the cable length

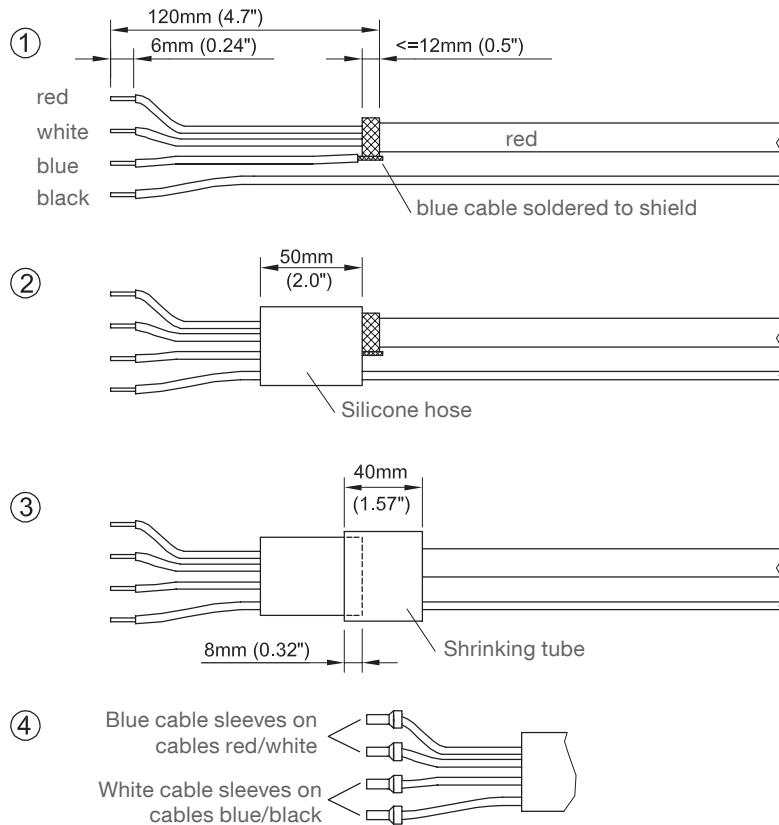
Push back the cable into the extension tube until the stated length is present. Take care that no cable is wound up inside the housing.  
 If the cables are too long to be pushed back, goto step 3, otherwise goto step 4.



## Assembly VN 4040

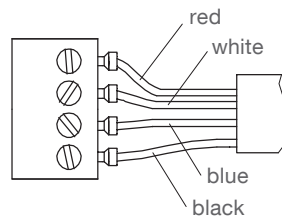
### 3. Cutting the cables (if required)

If the cables are too long to be pushed back into the extension tube, shorten the cable to the length as stated in step 2. Prepare the cables as shown. Use the attached hoses and cable sleeves for proper mounting.



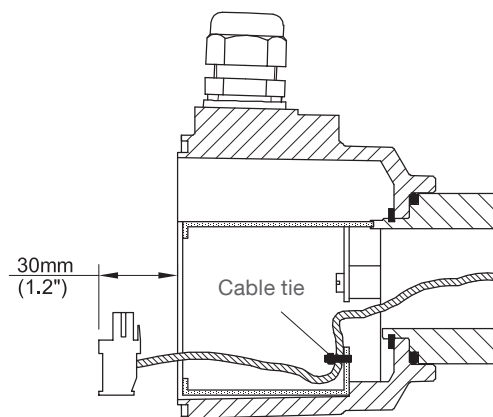
### 4. Connecting the plug

Observe correct sequence



### 5. Fixing the cable tie

Before fixing the cable tie observe correct cable length as stated and that no cable is wound up inside the housing.



### 6. Insert electronics

Insert the plug into the electronic, insert the electronic into the housing and fix the electronic plastic cover with 4 screws.



## Disposal

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The product consists of materials which can be recycled, details of the used materials see chapter "Technical data - mechanical data".

Recycling must be done by a specialised recycling company.